DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018–AC39

210-94

Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Pacific Pocket Mouse

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: The Fish and Wildlife Service (Service) determines the Pacific pocket mouse (*Perognathus longimembris pacificus*) to be an endangered species throughout its range in coastal southern California, pursuant to the Endangered Species Act of 1973, as amended (Act). Critical habitat is not being designated. This small rodent is an obligate resident of river and marine alluvium and coastal sage scrub plant communities in the immediate vicinity of the coast. Although the Pacific pocket mouse formerly occurred at a minimum of 8 general locales encompassing some 29 sites from Los Angeles County south to San Diego County, the only known, confirmed population extant occurs on the Dana Point Headlands in Orange County, California. A maximum of 36 confirmed, individual Pacific pocket mice has been detected on 3.75 acres of identified occupied habitat during the last 20 years. The Pacific pocket mouse is threatened with extinction due to documented depredation by domestic cats and habitat loss and fragmentation as a result of past and continuing land development projects. This rule implements and guarantees continued Federal protection provided by the Act for the Pacific pocket mouse, which was emergency listed as endangered on January 31, 1994 for a period of 240 days.

EFFECTIVE DATE: September 26, 1994.

ADDRESSES: The complete file for this rule is available for inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Carlsbad Field Office, 2730 Loker Avenue West, Carlsbad, California 92008.

FOR FURTHER INFORMATION CONTACT: Mr. Gail C. Kobetich, Field Supervisor, at the address listed above (telephone 619/431–9440).

SUPPLEMENTARY INFORMATION:

Background

The Pacific pocket mouse (*Perognathus longimembris pacificus*) is one of 19 recognized subspecies of the little pocket mouse (*Perognathus longimembris*) (Hall 1981). This species is one of the smallest members of the family Heteromyidae, which consists of spiny pocket mice (*Heteromys* and *Liomys*), pocket mice (*Perognathus* and *Chaetodipus*), kangaroo rats (*Dipodomys*), and kangaroo mice (*Microdipodops*). Virtually all (if not all) members of this family are nocturnal, granivorous and have external, deep, fur-lined cheek pouches (Ingles 1965; Dr. P. Brylski, consulting mammalogist, pers. comm., 1993).

Perognathus longimembris ranges in size from about 110 to 151 millimeters (mm) (4.3 to 5.9 inches) from nose to tip of tail (Hall 1981) and weighs 7 to 9 grams (¼ to ⅓ oz.) (Burt and Grossenheider 1976). The body pelage is spineless, bristle-free, and predominately brown, pinkish buff or ochraceous buff above and light brown, pale tawny, buff, or whitish below. There are typically two small patches of lighter hairs at the base of the ear. The tail can be either distinctly or indistinctly bicolored. The little pocket mouse exhibits a high degree of geographic variation in pelage color (Hall 1981; see also Ingles 1965). Vocalizations of this species include a high-pitched squeal.

The Pacific pocket mouse is the smallest subspecies of the little pocket mouse, ranging up to 131 mm (5.2 inches) in length from nose to tip of the long tail. The tail, hind foot, and skull structures of Pacific pocket mice are also the smallest of all little pocket mouse subspecies (Huey 1939). Stephens (1906) labeled the species an "* * * exceedingly small [p]ocket [m]ouse * * *" The Pacific pocket mouse is one of the smallest rodents in the world.

The Los Angeles pocket mouse (*Perognathus longimembris brevinasus*), which occurs mostly northeast of, and well inland from, the Pacific pocket mouse, is the only other subspecies of little pocket mouse that occurs in southern California west of the deserts. Individual Los Angeles pocket mice range in size from 125 to 145 mm (4.9 to 5.7 inches) long. Overall, Los Angeles pocket mice have longer tails, hind feet, skulls, and nasal bones than Pacific pocket mice (Huey 1939).

The Pacific pocket mouse was originally described by Mearns (1898) as a distinct species, *Perognathus pacificus*, based on the type specimen that was collected on the shore of the Pacific Ocean at Mexican Boundary Monument 258 in San Diego County, California. Although von Bloeker (1931a,b) initially recognized the Pacific pocket mouse as a distinct species, he subsequently concluded that *P. pacificus* represented two subspecies of the little pocket mouse, *P. longimembris pacificus* and *P. l. cantwelli*, after examining additional specimens (von Bloeker 1932). Subsequent to a biometric analysis of 331 specimens of the little pocket mouse, Huey (1939) recognized *P. l. pacificus* to be inclusive of the two subspecies described by von Bloeker (1932). Subsequent taxonomic treatments (e.g., Hall 1981; Williams et al. 1993) have retained the Pacific pocket mouse as a distinct subspecies. Although a taxonomic review of *P. longimembris* may be appropriate, the Pacific pocket mouse has been described as distinct from related forms (Dr. D. Williams, mammalogist, *in litt*, 1993).

Under section 3(15) of the Act (16 U.S.C. 1531 *et seq.*), the term "species" is defined to include recognized subspecies. Therefore, throughout the remainder of this rule, *Perognathus longimembris pacificus* (hereafter referred to as the Pacific pocket mouse), is treated as a "species".

The Pacific pocket mouse is endemic to the immediate coast of southern California from Marina del Rey and El Segundo in Los Angeles County, south to the vicinity of the Mexican border in San Diego County (Hall 1981, Williams 1986, Erickson 1993). The species has not been recorded outside of California (Williams et al. 1993; Erickson 1993). Erickson (1993) noted further that the Pacific pocket mouse has not been reliably recorded more than approximately 2 miles (3 kilometers) inland from the coast or above 600 feet (180 meters) in elevation.

The habitat requirements of the Pacific pocket mouse are not well understood, but they are known to occur on fine-grain, sandy substrates in the immediate vicinity of the Pacific Ocean (Mearns 1898, von Bloeker 1931; Grinnell 1933; Bailey 1939). The Pacific pocket mouse is or was known to inhabit coastal strand, coastal dunes, river alluvium, and coastal sage scrub growing on marine terraces (Grinnell 1933; Meserve 1972; Erickson 1993). Stephens (1906) trapped a female "* * * on a dry mesa a short distance back from the seashore." von Bloeker (1931a) reported that Pacific pocket mice detected near San Diego were found only in open patches of ground that were otherwise surrounded by weedy growth. M'Closkey (1972) and Meserve (1972, 1976b) detected the Pacific pocket mouse on sandy substrates in coastal sage scrub habitats in the San Joaquin Hills in Orange County, California. Brylski (1993)

detected the only known, confirmed population extant on the Dana Point Headlands on loose sand substrates in a coastal sage scrub community dominated by California buckwheat (*Eriogonum fasiculatum*) and California sage (*Artemisia californica*). Brylski (1993) commented that the Pacific pocket mouse's preferred habitat "* * * appears to be open coastal sage scrub on fine, sandy soil."

Little quantitative information is available on the ecology and life history of the Pacific pocket mouse. However, the attributes of the little pocket mouse and the available data that pertain to the Pacific pocket mouse subspecies suggest that this small rodent is facultatively or partially fossorial, relatively sedentary, primarily granivorous, and able to become torpid, estivate, or hibernate in response to adverse environmental conditions (e.g., Ingles 1965; Kenagy 1973; Dr. P. Meserve, academic mammalogist, pers. comm., 1994; Dr. R. MacMillan, academic mammalogist, pers. comm., 1994).

During those periods that they are not active on the surface of preferred substrates or in preferred habitats, Pacific pocket mice apparently dwell in underground burrows. Erickson (1993) noted that "[n]umerous small burrows revealed the presence of some colonies to early collectors." Kenagy (1973) observed that little pocket mice may stay in their burrows continuously for up to five months in winter, alternating between periods of dormancy and feeding on stored seeds. Periods of dormancy apparently may be induced by, or correlated with, food shortage (Kenagy 1973). Ingles (1965) noted that "[t]he ability of the little pocket mouse to become dormant for only a few bad nights is an important factor in its survival."

While active and above ground, little pocket mice have ranged up to 1,000 feet (320 meters) from their burrows in a 24-hour period (Burt and Grossenheider 1976). However, based on his study from 1969–1973 in the Owens Valley, California, Kenagy (1973) concluded that "* * * the maximum distance moved during the night by this little mouse was undoubtedly much less than 50 m." Reported little pocket mouse home ranges ranged in size from 0.12 to 0.56 hectares (0.30 to 1.4 acres) and populations ranged in density from 1 to 5.5 individuals/hectare (0.4 to 2.2 individuals/acre) in Joshua Tree National Monument, California (Chew and Butterworth 1964). Adult density at Dana Point Headlands was estimated to be 5.9/hectare (2.4/acre) by Brylski (1993).

Pacific pocket mice primarily eat the seeds of grasses and forbs (von Bloeker 1931; Meserve 1972, 1976a). Meserve (1976a) observed further that other plant materials were consumed, albeit in comparatively smaller quantities. P. Brylski (pers. comm., 1993) observed that "Pacific pocket mice foraged mainly on the seeds of grasses and, to a lesser degree, on leafy vegetation." Jameson and Peeters (1988) reported that little pocket mice, like other pocket mice species, also eat soil-dwelling insects.

Relatively little is known of the breeding biology of Pacific pocket mice. Erickson (1993), relying largely on data provided by Meserve (1972), noted that "[p]regnant and lactating females have been found from April through June with immatures noted from June through September." P. Brylski (pers. comm., 1993) observed lactating females in July and noted that two litters were produced that year. Limited reproduction was attributed to juveniles in the Dana Point Headlands population (P. Brylski, pers. comm., 1993). Jameson and Peeters (1988) described the little pocket mouse as "rather prolific" and indicated that "[p]regnancies occur in spring and fall with a summer lull."

Historical records indicate that the Pacific pocket mouse occurred in 8 general areas encompassing some 29 separate trapping sites. Approximately 80 percent of all Pacific pocket mouse records are from 1931 or 1932 (Erickson 1993). The following summary of records is organized by county:

Los Angeles County. The Pacific pocket mouse historically was detected in three areas—Marina del Rey/El Segundo, Wilmington, and Clifton. One hundred and eighteen specimens or live captures were recorded for the Marina Del Rey/El Segundo area from 1918 to 1938, with most (86) of these records coming from "Hyperion"; see Erickson (1993). Three specimens were collected in Wilmington in 1865 (voucher specimens on deposit at the Museum of Vertebrate Zoology, University of California, Berkeley) and four were collected in "Cliffton" [sic] in 1931. Four specimens from San Fernando in 1932 that were originally labeled as *P. pacificus/P. cantwelli* were referred to as *P. l. brevinasus* by von Bloeker (1932); see Erickson (1993). There have been no records of Pacific pocket mice from Los Angeles County since 1938 (Erickson 1993; P. Brylski, *in litt*, 1993).

Orange County. The Pacific pocket mouse has been confirmed at two locales in Orange County: the San Joaquin Hills and Dana Point. The species was found in Buck Gully (P. Meserve, pers. comm., 1994) and nearby "Spyglass Hill" in the San Joaquin Hills from 1968 to 1971 (M'Closkey 1972; Meserve 1972; R. MacMillan, pers. comm., 1994). Forty-four specimens or live captures from "Spyglass Hill" were recorded from 1968–1971 (see Erickson 1993). The only known, confirmed population extant of the Pacific pocket mouse was rediscovered in July of 1993 on the Dana Point Headlands in Orange County, California (Brylski 1993). G. Cantwell had previously collected 10 specimens of this species at this locale in May of 1932 (voucher specimens on deposit at the Natural History Museum of Los Angeles County).

Possible, recent records from Crystal Cove State Park (approx. 16 km (10 mi) NW Dana Point) resulting from pitfall trapping (see R. MacMillan, pers. comm., 1994) await confirmation given the uncertainty expressed by the observer and the negative results of recent walk-over and trapping surveys there (see P. Brylski, *in litt*, 1994 and J. Webb, *in litt*, 1994).

San Diego County. The Pacific pocket mouse historically was confirmed at three general locales in San Diego County—the San Onofre Area, Santa Margarita River Estuary, and the lower Tijuana River Valley. One specimen was obtained at San Onofre in 1903 and two others were secured at that locale in 1931. Seventy-one specimens or live captures were recorded for the Santa Margarita River mouth area between 1931 and 1936, with the majority (50) of these reported for "Oceanside". One hundred and thirty-four specimens or live captures have been recorded from the lower Tijuana River Valley, including the type specimen. There has not been a confirmed Pacific pocket mouse record at these locales or elsewhere in San Diego County since 1932 (see Erickson 1993).

However, there have been three recent, unconfirmed reports of the Pacific pocket mouse from San Diego County. A document released by the California Department of Fish and Game (Mudie et al. 1986) pertaining to the wildlife resources at the San Dieguito Lagoon, Del Mar, and at least one subsequent environmental "baseline study" pertaining to that locale (see S. Montgomery, consulting biologist, *in litt*, 1994 and R. Erickson, consulting biologist, pers. comm., 1994) provide species lists that contain the little pocket mouse (*Perognathus longimembris*). Given the location of the survey effort, it seems almost certain that any and all little pocket mice recorded at this locale would be Pacific pocket mice. However, it was subsequently ascertained that none of the surveyors or report authors could

recall capturing a little pocket mouse on the site or reporting same (e.g., Montgomery *in litt*, 1994; R. Erickson, consulting biologist, pers. comm., 1994). Subsequent walk-over surveys of the area in 1992 did not reveal the presence of the Pacific pocket mouse (Dr. P. Behrends, consulting mammalogist, pers. comm., 1994).

A single Pacific pocket mouse was reported from Lux Canyon, Encinitas, in June 1989. The record is now considered only probable by the observer (Erickson 1993).

Most recently and since the publishing of the proposed and emergency rules, Mr. S. Tremor (*in litt*, 1994) reported what he believes to be a single Pacific pocket mouse from a locale in Del Mar, California. However, the animal escaped before photographs or a pelage description could be obtained. Given these considerations, the Service concludes, in the present absence of definitive or additional information, that the Del Mar observation, although certainly deserving of further attention and investigation, remains unconfirmed until such time that a positive species identification can be made. P. Brylski (pers. comm., 1994) independently has arrived at the same conclusion.

Accordingly, the only known, recently confirmed population of the Pacific pocket mouse extant remains on the Dana Point Headlands. Between 25 to 36 individual Pacific pocket mice were detected there by Brylski (1993) during trapping surveys that extended into August. Prior to this recent rediscovery of the Pacific pocket mouse at the Dana Point Headlands, the Pacific pocket mouse had not been positively observed since 1971 (see Erickson 1993). Numerous, relatively recent small-mammal survey and trapping efforts within the potential range of the Pacific pocket mouse (e.g., Salata 1981; Jones and Stokes 1990; Taylor and Tiszler 1991; D. Erickson, pers. comm. 1993; P. Brylski, *in litt*, 1993; P. Behrends, pers. comm., 1994; Dr. P. Kelly, mammalogist, pers. comm., 1994; R. MacMillan, pers. comm., 1994; Dr. R. Dingman, mammalogist, pers. comm., 1994; Dr. J. Webb, biologist, *in litt*, 1994; S. Montgomery, consulting biologist, *in litt*, 1994; P. Brylski, *in litt*, 1994; United States Fish and Wildlife Service 1994a; United States Fish and Wildlife Service 1994b) have failed to locate additional extant populations.

From a species perspective, the persistence of the Pacific pocket mouse is important, perhaps essential, in preserving an important and unique portion of the historic habitat of the little pocket mouse and in preserving potentially unique genetic stock. The Pacific pocket mouse's adaptation to, and dependence on, coastal dune and coastal alluvium substrates and coastal sage scrub habitats have probably contributed to a genetic divergence from other subspecies of the little pocket mouse. Maintaining a broad genetic stock may be critically important to the species ability to adapt to changing environmental conditions. The apparent sedentary nature of the Pacific pocket mouse (Meserve 1972; Meserve, pers. comm., 1994) and the fragmentation of this species' potential habitat increase the probability that localized extirpations caused by the destruction of habitat or movement corridors will be permanent. This could significantly reduce the extent of any possible introgression between subpopulations and reduce genetic heterozygosity and the overall fitness of the species. Such perturbations could result in a permanent loss of genetic stock or, at the extreme, result in the extinction of the Pacific pocket mouse.

Previous Federal Action

The Pacific pocket mouse was designated by the Service as a category 2 candidate species for Federal listing as an endangered or threatened species in 1985 (50 FR 37966). It was retained in this category in subsequent notices of review published by the Service in the **Federal Register** in 1989 and 1991 (54 FR 554 and 56 FR 58804, respectively). Category 2 comprises taxa for which information now in the possession of the Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which conclusive data on biological vulnerability and threat are not currently available to support proposed rules.

Largely because of documented, imminent threats to the only known population of the Pacific pocket mouse, the Service published an emergency rule to list the species as endangered on February 3, 1994 (59 FR 5306). Interim protection afforded the Pacific pocket mouse as the result of the promulgation of the emergency rule expires on September 28, 1994. A proposed rule to list the Pacific pocket mouse was concurrently published with the emergency rule (59 FR 5311).

Summary of Comments and Recommendations

In the proposed rule and associated news release announcing the promulgation of the proposed rule and emergency rule, all interested parties were requested to submit factual reports or information that might contribute to the development of a final rule. The news release was provided to media throughout southern California and to the national media. In addition, 3 Federal agencies, 3 state agencies, 15 county and city governments, and 6 other potentially affected or interested parties were individually notified of the promulgation of the emergency and proposed rules. Representatives of Marine Corps Base, Camp Pendleton; the County of Orange; the City of Dana Point; and the Dana Point Headlands landowner, among others, were personally contacted by Service personnel. Newspaper articles in the *Los Angeles Times* and *Orange County Register* announcing the emergency listing of the Pacific pocket mouse and scheduled public hearing appeared in February and March 1994.

The Service held a public hearing on the proposed rule on March 24, 1994, in San Clemente, Orange County, California. Notification of the hearing was published in the **Federal Register** on March 1, 1994 (59 FR 9720). Newspaper notices specifically announcing the hearing and inviting general public comment on the proposal additionally were published in the *Orange County Register* and *San Diego Union Tribune*. Approximately 25 people attended the hearing and seven of these provided oral comments.

A total of 71 comments was received. Although the comment period technically closed on April 4, 1994, the Service considered all comments received through June 20, 1994. (Five comments were received by the Carlsbad Field Office after the deadline, including one from an interested and potentially affected municipal jurisdiction.) Multiple comments whether written or oral from the same party are regarded as one comment.

Of the comments received, 48 persons or organizations (68 percent) supported listing; 10 (14 percent) urged the protection of the only confirmed, occupied habitat of the Pacific pocket mouse on the Dana Point Headlands; 3 (4 percent) were against the listing; 3 (4 percent) were in favor of the development of the Dana Point Headlands; 4 (6 percent) urged the application of sound science to the listing process; and 3 (4 percent) were noncommittal.

Two Federal agencies and the sole city government responding were neutral on the issue of listing. The California Department of Fish and Game previously had gone on record as supporting a proposal to list the Pacific pocket mouse (K. Berg, *in litt*, 1992). No citizens groups or organizations opposed the proposed listing. Attorneys

for one landowner voiced opposition to both the emergency listing and proposed listing.

The Service has reviewed all of the written and oral comments described above including those that were received outside of the formal comment periods. Based on this review, 11 relevant issues have been identified and are discussed below. The Service considers these issues to be representative of the comments questioning or opposing the proposed listing action.

Issue 1: One commenter noted that the listing action should not occur because the Pacific pocket mouse subspecies is not a valid taxon and the subject of taxonomic controversy. The commenter quotes a letter from Mr. P. Collins, Associate Curator of the Santa Barbara Museum of Natural History, to D. Erickson, in which it is stated that "* * * I think that it is imperative that the taxonomic status of the various subspecies of *Perognathus longimembris* in central and southern California be reevaluated using modern systematic techniques such as electrophoresis and multivariate morphometrics. The systematic questions will need to be answered before any population of this species can be proposed for possible listing status." The commenter further noted that "* * * Service officials appeared to have significant concerns regarding the appropriateness of listing the PPM [Pacific pocket mouse] in the absence of sufficient data on the taxonomy issue—even as recently as November 1993. (Exhibit J)" The Service is obliged to consider available data pertaining to the genetic relationship between the Pacific pocket mouse and other groups of little pocket mice as provided by Patton et al. (1981). The commenter added that the subspecies designation is controversial and that "* * * alleged morphological characteristics could be the product of seasonal or ecological variation among pocket mice. A proper resolution of the resolution of the PPM's true status is required before the Service can act to list the PPM as a subspecies. * * *"

Service Response: Although the Service initially and independently reviewed all available information relating to the taxonomy, ecology, biology, status and distribution of the Pacific pocket mouse, the Service also solicited comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, and any other interested party on these and all other aspects of the proposed rule. In particular, the Service has made a concerted effort to obtain the best available scientific information regarding the taxonomy of the Pacific pocket mouse.

Despite a recent taxonomic treatment of the rodent family Heteromyidae published by the American Society of Mammalogists (Society), the Service nonetheless solicited the expert opinions and input of, among others, the President of the Society and the principal author of the published taxonomy (Williams et al. 1993) regarding the taxonomic validity of *Perognathus longimembris pacificus.* The Service considers the Society to be a recognized authority on the taxonomy and biology of North American mammals.

As is suggested by the commenter, the Service does have significant concerns regarding the appropriateness of listing any species and carefully considers its mandate in that regard as set forth by section 4 of the Act. In the present case, however, the Service cannot agree that there is, as suggested by the commenter, an absence of sufficient data pertaining to the taxonomy of the Pacific pocket mouse.

The Pacific pocket mouse was originally described by Mearns (1898) as a distinct species, *Perognathus pacificus.* Subsequent to several intervening taxonomic treatments or investigations (e.g., Stephens 1906; von Bloeker 1932; Grinnell 1933; Huey 1939), Hall (1981) and others have recognized the Pacific pocket mouse as a distinct subspecies of the little pocket mouse. Although the taxonomical history of this species spans some 90 years and there is a current, peer-reviewed, published classification of the heteromyid rodents inclusive of the pocket mice taxa (Williams et al. 1993), the Service nevertheless contacted Dr. Williams to insure that there was no doubt as to the current, correct taxonomic treatment of the subject subspecies (see D. Williams, *in litt,* 1993, which is identical to the commenter's Exhibit J). Dr. Williams (*in litt,* 1993) confirmed the taxonomic validity and distinctness of the Pacific pocket mouse.

Although it is recognized that a "* * * modern revision of the *longimembris* complex might cause a re-evaluation of the various subspecies of this taxon", the Service presently has no information or scientific basis to refute a recognized authority's assertion that "* * * there is certainly every reason to consider *pacificus* valid with current information" (Dr. J. L. Patton, President of the American Society of Mammalogists, *in litt,* 1994). Patton et al. (1981) did not address the biochemical systematics of perognathine pocket mice (which include the little pocket mouse and Pacific pocket mouse).

Mr. Collins has informed the Service (pers. comm., 1994) that he has no alternative taxonomy to propose and is not now, and will not be in the foreseeable future, investigating the taxonomy of *Perognathus longimembris.* By contrast, P. Brylski has indicated (*in litt,* 1993) that he and others are currently investigating the systematics of *Perognathus longimembris* utilizing sequencing regions of mitochondrial DNA and morphology. To date, no results from these studies have been published or are otherwise forthcoming. In the interim, P. Brylski (*in litt,* 1994) has most recently indicated that "[a]t this time, there is no evidence that contradicts the taxonomic distinctiveness of *P. longimembris pacificus.*"

The traditional scientific approach to defining vertebrate subspecies has been based almost exclusively on the identification of morphological differences in body measurements and other morphometric characters between geographically distinct populations of a species. Given its apparent, current rarity, limited mobility, and distance from other subspecies of the little pocket mouse (see, for instance, Meserve 1972; Hall 1981; P. Brylski, *in litt,* 1993; Erickson 1993) and the definition and expected course of speciation, it seems reasonable to assume that the Pacific pocket mouse is now, or will be, a de facto "full" species or genetically-isolated taxonomic entity unto itself.

In the absence of current, definitive information to the contrary from an expert (or any other) source, the Service presently concludes that the Pacific pocket mouse subspecies constitutes a valid taxon.

Issue 2: The same commenter concluded that the proposed rule must be withdrawn because the Service improperly and secretly elevated the species to a category 1 candidate status on the basis of new information that was obtained in 1993.

Service Response: The three candidate levels (1–3) used by the Service are administratively defined to periodically advise the public on the status of various taxa that might come under the protection of the Act. The terms "candidate" or "category 1" do not appear in the Act or implementing regulations in 50 CFR. The Service had previously notified the public in its candidate notices of review (e.g., 56 FR 58805) that when sufficient information was available, a proposed rule might result. Section 4(b)(7) of the Act

specifically authorizes the Service to promulgate emergency rules when the well-being of a species is at significant risk. A species need not be a previously declared category 1 candidate species to meet the criteria for threatened or endangered status and to be proposed accordingly or to have an emergency rule promulgated. For reasons that are fully explored in the "Summary of Factors" portions of the February 3, 1994, emergency rule (59 FR 5306) and this rule, the Service concludes that the Pacific pocket mouse fully met and still meets the criteria necessary to promulgate a rule listing the species as endangered.

The new information obtained in 1993 consists of all materials and data that became available to the Service pertaining to, in part, the status, distribution, ecology, and biology of the Pacific pocket mouse. Included in these submittals was an updated manuscript by R. Erickson (1993). Accompanying this manuscript were records of Pacific pocket mouse museum or collection specimens and related documentation, raw data and notes reflecting searches for additional Pacific pocket mice records, peer-review correspondence, communications with experts in the field, an updated bibliography, and other, relevant materials. Also received in 1993 were Brylski's (1993) report and additional correspondence (P. Brylski, *in litt*, 1993) that confirmed the rediscovery of the Pacific pocket mouse on the Dana Point Headlands. During the prescribed public comment period, the commenter viewed and photographed or otherwise received all such materials.

Subsequent to an examination of all pre-existing information and important, additional data received in 1993, the Service concluded that sufficient data and information existed to list the Pacific pocket mouse on an emergency basis pursuant to section 4 of the Act and implementing regulations pertaining thereto. Given the information and data that has been forthcoming since that time, the Service concludes that the emergency listing was appropriate and that the species continues to meet the criteria as an endangered species.

Issue 3: The same commenter observed that the "* * *[p]roposed rule should be withdrawn because the Service lacks scientific data to support a listing of the PPM as threatened or endangered." The Service currently has insufficient information to assess the status and distribution of the Pacific pocket mouse. Specifically, the commenter argued "* * *that a substantial number of trap nights—perhaps a minimum of roughly 500—must be employed in any survey effort deemed to have any relevance for reaching conclusions on presence/absence. Consistent with this need for reliable data, the M.H. Sherman Company conducted 643 trap nights during its survey efforts at the Dana Headlands site." The commenter further argued that the majority of other recent surveys either were conducted "* * *when the PPM can be expected to be dormant* * *" (e.g., Taylor and Tiszler 1991) or at "[s]ites for which no survey dates are provided (and thus cannot be considered to provide reliable presence or absence data)* * *" (e.g., the Santa Margarita River Mouth). "An examination of the data for just the eight (8) locations historically known to have occupied habitat* * *reveals a similar lack of information upon which to draw a conclusion about the appropriateness of listing. The Service's own document indicates that a live trapping program is needed before the appropriateness of any listing can be made." Another commenter encouraged the Service "* * *to fully investigate all remaining historic habitats as well as potential habitat areas for the Pacific pocket mouse before making a final determination on its status." One commenter concluded that "[t]he Service's failure to establish and publish the accepted survey protocol for the PPM prior to the close of the public comment period renders this rule-making process invalid."

Service Response: In response to similar comments regarding the proposed listing of three Gulf Coast beach mice species (*Peromyscus*), the Service (June 6, 1985, 50 FR 23874) argued that "[i]t is not necessary to have precise population numbers to determine that the beach mice are endangered; indeed, it would probably be impossible to obtain such numbers." In that instance, the Service concluded that the three beach mice were endangered after a thorough review of adequate, relevant population data and documentation of habitat loss or perturbation, documented depredation, and other factors affecting the species.

In consistent fashion, the Service has made every attempt to obtain the best scientific information and data relating to the status of the Pacific pocket mouse and the factors affecting that species. Subsequent to a thorough consideration of these data and information, the Service concludes that said data and information are adequate and collectively support a listing as endangered. In particular, a composite of the relevant data summarized and reported by Hall (1981), Williams (1986), Williams et al. (1993), and Erickson (1993), the specimen records at institutions throughout California, and the additional data, references, and records summarized herein demonstrates that there in not a paucity of relevant information on the Pacific pocket mouse or the small rodent species of southern California in general.

An analysis of this very same information reveals that credible determinations of presence/absence of the Pacific pocket mouse (and many other small rodent species) depend on a number of factors that are not a function of the number of survey trap nights. Legitimate small mammal trappers in California are all licensed by the California Department of Fish and Game and many possess endangered species permits from the Service. These scientific surveyors are professionally obligated and charged with knowing the conditions and circumstances that will maximize the chances of detecting the Pacific pocket mouse during focused surveys or otherwise result in an adequate characterization of the rodent community at any given locale. An adequate assessment of the appropriate number of trap nights and number of trapping bouts during a given survey should reflect the experience of the surveyor and will certainly incorporate, at a minimum, the results of walk-over surveys for small rodent sign and burrows, analyses of the size and physical characteristics of the area being surveyed, the adjudged, current trappability of the target species, apparent suitability or "quality" of site habitat(s), time of year, phase of the moon, and the climatic conditions. Thus, a given focused survey for the Pacific pocket mouse may appropriately require far less than, or far greater than, five hundred trap nights.

All of the above considerations are factored into the Service's guidelines for surveying the Pacific pocket mouse (U.S. Fish and Wildlife Service 1994c) and it is likely that the protocol will evolve pursuant to the recommendations of permitted surveyors and expert sources. Although the Service has stipulated a minimum of five trapping bouts at each site to reflect the rarity and possible difficulty in locating or trapping the Pacific pocket mouse (e.g., Erickson 1993; Behrends, *in litt*, 1994), it is further stated that "[a] lesser effort may be approved by the Carlsbad Field Office on a case by case basis." (U.S. Fish and Wildlife Service 1994c). If, for instance, the objective is to merely establish presence/absence at a given locale, then a lesser effort may well be justified if Pacific pocket mice

are detected in the first four trapping bouts. The recent, successful trapping survey at the Dana Point Headlands is a case in point. Although the Service concedes that the 643 trap-night effort at that locale in 1993 was justified, in that particular instance, to establish the approximate range and extent of the local Pacific pocket mouse population, it is nonetheless true that 9 Pacific pocket mice were discovered during the first night of trapping subsequent to the placement of 60 "effective" live traps at the site (Brylski 1993).

Even though it is apparent that Pacific pocket mice have not been recorded in December, January, or February of any given year (see Erickson 1993) and that the species apparently is most detectable from April to August (e.g., Meserve 1972), it cannot be assumed that the species is entirely undetectable during winter months. Subsequent to his long-term (1969–1973) study of the little pocket mouse at an elevation of approximately 1,220 meters (4,000 feet) in the Owens Valley, California, Kenagy (1973) observed that "[t]he extent of winter activity in the population of *P. longimembris* was different in each of the three winters, ranging from zero to 5 months of activity.* * *" Thus, the Service cannot automatically assume that trapping surveys during winter months are of no value in determining the presence/absence of the Pacific pocket mouse. If Pacific pocket mice are active during a given period in winter, however, surface sign should be visible. In any case, a review of the methodology employed by Taylor and Tiszler (1991) reveals that "[t]rapping began in November of 1988 and was completed May 1989." Thus, these authors did conduct trapping in at least portions of 4 calendar months during which Pacific pocket mice have been recorded (Taylor and Tiszler 1991; see also Erickson 1993).

In the emergency rule, R. Zembal, U.S. Fish and Wildlife Service (pers. comm., 1993), is cited as a source to corroborate the statement that recent small trapping efforts at the Santa Margarita River Mouth have failed to detect the presence of the Pacific pocket mouse (59 FR 5307). As is reflected in the Pacific pocket mouse species file at the Carlsbad Field Office, the referenced communication was "[t]he Service has looked repeatedly and intensively for the Pacific pocket mouse at the Santa Margarita River Mouth in recent years with no success."

This statement is borne out by records of recent survey and trapping efforts at that locale. Salata (1981) failed to detect the Pacific pocket mouse at the Santa Margarita River Mouth on Marine Corps Base, Camp Pendleton, in dune, pickleweed/saltgrass, pickleweed, and glasswort/upland grassland habitats during a survey effort in March 1981 that included 188 trap nights. Similarly, the Service (1994a) reported no captures of the Pacific pocket mouse from June 1986 intermittently to August 1990, during a study of the Santa Margarita River Mouth that involved a total of 11,380 trap nights and included surveys of coastal strand, maritime scrub, salt pan, *Salicornia* upland, *Salicornia/ Distichlis* habitats, and *Salicornia* plots. Repeated trapping bouts at optimum times and in documented Pacific pocket mice habitats maximized the possibility of detecting the species. From 1986 to 1987, for instance, coastal strand habitats were surveyed in June, May, and then again in August for a total of 240 trap nights. In addition, potential habitat in maritime scrub, *Salicornia* upland, *Salicornia/Distichlis* dominated areas, and *Salicornia* plots were surveyed during the same calendar months for a total of 2,040 trap nights. Trapping bouts in all of the above-mentioned habitats during October of 1986 and February of 1987 resulted in additional 1,320 trap nights of survey data.

The Service document referenced by the commenter, a draft proposal calling for a live trapping program, is not on letterhead, not dated, and not signed by a Service Field Supervisor or person acting on his or her behalf. Although the date of the document is unknown, Service staff recall that this document has been in the files since at least November 1991. Thus, this draft document predates the receipt or filing of all of the substantive data and scientific papers that were received in 1993 and 1994.

Given all of the information that was received in 1993 and the additional information and materials that have been received since, the Service concludes that sufficient, adequate data are available to assess the likely status and distribution of Pacific pocket mice at the remaining historic locales and elsewhere throughout its historic range. The known present and past status and distribution of the Pacific pocket mouse at these historic locales are again individually reviewed below in the "Summary of Factors Affecting the Species" section of this rule.

Issue 4: The data used by the Service to estimate the remaining potential habitat of the Pacific pocket is inadequate. In particular, "* * * the Service's data for San Diego County, Oberbauer and Vanderwier (1991), turns out, upon inspection, to consist of nothing more than unsubstantiated speculation on the part of two individuals."

Service Response: The Service considers Oberbauer and Vanderwier's (1991) published evaluation of the present, depleted status of vegetation communities in San Diego County to be amongst the best available scientific information on the subject. Given the data base and expertise at the disposal of The Department of Planning and Land Use for the County of San Diego, the Service has no reason to doubt the validity of the presented data. No data or analysis have been submitted to refute their findings. By contrast, the data, analyses, and conclusions presented by Soule et al. (1992), summarized by the Service (March 30, 1993; 58 FR 16742), and the relevant references cited therein are corroborative.

The Service further concludes that the reported, extreme reduction in the potential range and extirpation of the Pacific pocket mouse in Los Angeles County is corroborated by a recent assessment of the land use status of low-elevation lands therein. In the final rule listing the coastal California gnatcatcher (*Polioptila californica californica*) as threatened (March 30, 1993; 58 FR 16742), it was reported that over 96 percent of the habitat below 250 meters (800 feet) that might have supported the gnatcatcher have been largely or entirely developed. Although the coastal California gnatcatcher is sympatric with the only known, confirmed population of Pacific pocket mouse on the Dana Point Headlands (EDAW 1993), the latter species has not been documented above approximately 180 meters (600 feet) (Erickson 1993) and apparently does not extend nearly as far inland as the former species (summarized March 30, 1993; 58 FR 16742). Thus, given the intense, almost complete development of the immediate coast in Los Angeles County, the Service believes that it is reasonable to predict that the past reduction in the range of the Pacific pocket mouse there exceeds the corresponding reduction in the Los Angeles County range of the coastal California gnatcatcher.

Issue 5: "The Service should explain that with only 8 known historic locations of the PPM and considering the available data on the animal, the PPM may never have been abundant in either the number of populations in the United States or the number of individuals in those populations, at least for the last hundred years." In support of this position, the commenter also notes that Stephens (1906) described the Pacific pocket mouse as "one of the rarest animals." The

commenter additionally indicates that "[t]he Service should also explain that the PPM may be much more abundant and widespread than suggested in the [p]roposed [r]ule."

Service Response: Because the Pacific pocket mouse range-wide has been variously described as "exceedingly difficult to catch" with snap traps (von Bloeker 1931a) or "quite trappable" once located (R. M'Closkey, pers. comm., 1994; P. Meserve, pers. comm., 1994; R. MacMillan, pers. comm., 1994), the Service concludes that this anomaly is generated as a result of the patchy distribution of the species and its ecological requirements (e.g., M'Closkey 1972; Meserve 1976b; P. Meserve, pers. comm., 1994; R. M'Closkey, pers. comm., 1994; R. MacMillan, pers. comm., 1994; P. Brylski, *in litt,* 1994). Apparently, the "* * * rareness of the Pacific pocket mouse is not an artifact of low trappability * * *" (P. Brylski, *in litt,* 1994). Even in an area (the San Joaquin Hills) where the Pacific pocket mouse was repeatedly located and studied during two research investigations of the ecology of the local rodent community, the species was described there as rare (M'Closkey 1972) or present in relatively low numbers (P. Meserve, pers. comm., 1994).

Accordingly, given a composite of the available information and data, the Service concludes that there are no data, substantive or otherwise, that support the hypothesis that the Pacific pocket mouse is much more abundant and widespread than suggested in the proposed rule. Although the persistence of the Pacific pocket mouse on 45 acres of occupied or potentially-occupied habitat (Brylski 1993) suggests the real possibility that populations of the species exist elsewhere, confirmed extant populations away from the Dana Point Headlands have not been found or rediscovered in over 20 years. Thus, given the range-wide survey data and all other relevant information now available, the Service concludes that the Pacific pocket mouse is a patchily distributed species that has been described as locally abundant (Bailey 1939) to rare on carefully studied plots. Further, this mouse has become increasingly rare as a result of human-induced, direct impacts that are presented and discussed in the "Summary of Factors Affecting the Species" section of this rule.

Issue 6: The same commenter observed that "[t]he Service mischaracterizes the threat to the Dana Headlands PPM population because the development of the site is not imminent and any threat posed by feral or domestic cats cannot be effectively ameliorated by a listing; accordingly, the [e]mergency [r]ule is improper."

Service Response: The Service acknowledges that the development of the Dana Point Headlands currently is not as imminent now as it appeared in February of 1994. Since the publishing of the emergency and proposed rules, the citizens of Dana Point have forced a referendum on the proposed project that apparently will be decided in November of 1994. The referendum and subsequent possible City of Dana Point actions could result in the delayed implementation of, or modifications to, the proposed project. The commenter has agreed, however, that "* * * the Dana Headlands site is the only location recently shown to contain PPM" and that the landowners are requesting approval of a specific plan that includes "* * * development on and near the area where the PPM was trapped in 1993."

The Service disagrees that the documented predation by domestic and feral cats cannot be effectively ameliorated by a listing. The mission and mandate of the Service is to recover listed species utilizing the funds and authority that Congress provides. A recovery plan for the Pacific pocket mouse will almost certainly provide for means and measures to prevent or reduce the depredation of the species. The Service hopes and trusts that it will be able to enlist the cooperation of all landowners and cat owners in or near occupied or suspected Pacific pocket mouse habitat to prevent the continuing endangerment or extinction of the species.

Issue 7: The same commenter concluded that listing of the Pacific pocket mouse is not warranted because a comprehensive survey for the species has not been done in Baja California, Mexico.

Service Response: The Service finds no scientific basis for concluding or speculating that a possible population or populations of Pacific pocket mice in Mexico preclude the need to list the species. Although the range map in Hall (1981) suggests that the range of the Pacific pocket mouse may extend into northwestern Baja California, Mexico, there are no known records of the species outside of California and, thus, the United States as a whole (Hall 1981; Erickson 1993; Williams et al. 1993). By contrast, an analysis of species limits maps (Hall 1981) and composite of documented records (Hall 1981; Williams et al. 1993) reveals that at least 12 small rodent species have been historically recorded on the coast of northwestern Baja California in San Quintin, Ensenada, or their environs, to wit: *Perognathus baileyi, Perognathus arenarius, Perognathus fallax, Dipodomys agilis, Dipodomys merriami, Dipodomys gravipes, Reithrodontomys megalotis, Onochomys torridus, Peromyscus californicus, Peromyscus maniculatus, Microtus californicus, and Neotoma fuscipes.* Consequently, the best available data does not support the conclusion that the Pacific pocket mouse may occur in Mexico. Delaying listing until surveys outside of the known range had been completed would not be in keeping with the purposes of the Act.

Even if the Pacific pocket mouse occurs in coastal Baja California, it is likely that the species does not occur south of 30° north latitude, which represents an important transition zone for various birds, plants, land mammals, and other animal taxa. If, in an extreme case, it is true that the species is patchily distributed southward to 30° north latitude, the Service, pursuant to analyses and subsequent conclusions reached prior to the listing of the coastal California gnatcatcher, presently concludes that the United States historic distribution of the Pacific pocket mouse would represent a significant portion of the species' overall (hypothetical) range (see 58 FR 16742).

Issue 8: "Although the Pacific pocket mouse is not one of the identified species in the State's [Natural Communities Conservation Planning] program, it may be included in the subregional NCCP for this area." The County of Orange has been provided with updated habitat information and the subregional plan is currently being prepared. Therefore, "* * * the characterization of the NCCP program as 'inadequate' may be premature."

Service Response: The only use of the word "inadequate" in the proposed or emergency rules (59 FR 5306) refers to the previously proposed program to control domestic cat predation on the Dana Point Headlands and not to the State's NCCP program. As currently proposed, the NCCP program may, in fact, eventually result in the conservation of the Pacific pocket mouse or the species' potential habitat. At the present time, however, it remains true that Pacific pocket mouse is not an NCCP target species and no subregional plans or individual plans have been completed or implemented that would provide for the protection of the only known, confirmed population or the conservation of the species as a whole.

Issue 9: The proposed relocation of the only confirmed population extant is not a viable conservation alternative for the species.

Service Response: Given the apparent rarity of the Pacific pocket mouse and the experimental nature of relocation programs, the Service would carefully review any proposal to relocate—in whole or in part—any population of the Pacific pocket mouse. It remains true that one of the central purposes of the Act is to protect the natural habitat of the listed species. However, if and when Pacific pocket mouse population levels allow, the Service likely will investigate the possibility and feasibility of translocating animals to historically-occupied locales or other areas with suitable habitat and attributes to affect the recovery of the species or, in an extreme case, prevent extinction. Pursuant to the requirements of the purpose and section 7 of the Act, the Service likely would solicit the cooperation and participation of all Federal agencies and landowners in this regard.

Issue 10: The listing of the Pacific pocket mouse may be in conflict with Federal statutory authority (22 U.S.C. 277d–32) and important Federal, international wastewater treatment and flood control projects along the Tijuana River that will diminish threats to public health and safety.

Service Response: Several recent surveys conducted in the Tijuana River Valley (e.g., U.S. Fish and Wildlife Service 1994b) have not resulted in detections of the Pacific pocket mouse. Therefore, given the best scientific information available, the listing of the Pacific pocket mouse apparently will not conflict with the proposed projects. Even if the Pacific pocket mouse is rediscovered in the Tijuana River Valley or found elsewhere in Federal project "action areas," as defined at 50 CFR 402.02, the Act provides, under prescribed circumstances involving public health and safety, for expedited emergency consultations.

Issue 11: The Service must comply with Executive Order No. 12630 and conduct a takings analysis before reaching any final decision on listing the Pacific pocket mouse. The commenter noted that the executive order "* * * requires the preparation and consideration of a Takings Implication Assessment ('TIA') by a United States executive agency before that agency takes actions which may result in a taking of private property for which compensation may be due under the Fifth Amendment of the Constitution."

Service Response: In accordance with 16 U.S.C. 1533(b)(1)(A) and 50 CFR 424.11(b), listing decisions are made solely on the basis of the best scientific and commercial data available.

In adding the word "solely" to the statutory criteria for listing a species, Congress specifically addressed this issue in the 1982 amendments to the Act. The addition of the word "solely" was intended to remove from the process of the listing or delisting of species any factor not related to the biological status of the species. It was determined by a congressional committee that economic considerations have no relevance to determinations regarding the status of species. The application of economic criteria to the analysis of these alternatives and to any phase of the species listing process is applying economics to the determinations made under section 4 of the Act and was specifically rejected by the inclusion of the word "solely" in the legislation (see H.R. Report No. 567, part I, 97th Congress, 2d Session 20 [1982]).

Therefore, the Service concludes that it cannot consider a "TIA" until a final decision has been made whether or not to list a proposed species. However, with the signing and publication of this rule in the **Federal Register**, the Service will complete and consider a TIA.

Summary of Factors Affecting the Species

After a thorough review and consideration of all available information, the Service has determined that the Pacific pocket mouse should be classified as an endangered species. Procedures found at section 4(a)(1) of the Act (16 U.S.C. 1533) and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act were followed. A species may be determined to be endangered or threatened due to one or more of the five factors described in section 4(a)(1). These factors and their application to the Pacific pocket mouse (*Perognathus longimembris pacificus*) are as follows:

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* The Pacific pocket mouse historically was recorded and confirmed at eight locales encompassing some 29 specific trapping stations or sites (see Erickson 1993). Currently, however, the Pacific pocket mouse is known to exist at only one site on the Dana Point Headlands, City of Dana Point, Orange County, California. Although the Dana Point Headlands have not been developed or significantly altered since the Pacific pocket mouse was detected at this locale, the "* * * landowners are requesting approval on a specific plan from the City of Dana Point, which plan envisions development on and near the area where PPM were trapped in 1993" (A. Hartzell, Attorney-at-Law *in litt*, 1994; see also EDAW 1993 and City of Dana Point, *in litt*, 1994).

The recent status of the Pacific pocket mouse and its habitat has been summarized by Erickson (1993) based on a comprehensive search for museum specimens and capture records and conversations with pocket mice researchers and recognized expert sources. Other records and information have been obtained by the Service and made part of the public record pertaining to this action. A composite of this information is arranged by county and summarized below:

Los Angeles County. The Pacific pocket mouse historically was detected in three areas—Marina del Rey/El Segundo, Wilmington, and Clifton. Two of the three historic locales for the Pacific pocket mouse (Clifton and Wilmington) in Los Angeles County have been developed (Erickson 1993). The Service is unaware of potential Pacific pocket mice habitat at these two locales; none was disclosed or revealed as a result of the Service's request for information. The third historic locale (Marina del Rey/El Segundo) apparently has been substantially altered since the species was last detected there (Erickson 1993; P. Brylski, *in litt*, 1993). The Hyperion area, which formerly contained relatively large expanses of coastal strand and wetland habitats, has been extensively developed. Although potential habitat remains at the El Segundo Dunes, walk-over and trapping surveys by J. Maldonado and P. Brylski, including a 366-trap-night effort in July of 1993, have caused the latter surveyor to conclude that is "unlikely" that the Pacific pocket mouse occurs there (P. Brylski, *in litt*, 1993).

Elsewhere in Los Angeles County, a focused survey for the Pacific pocket mouse in Culver City consisting of 600 trap nights over three nights in June of 1991 in remnants of appropriate habitat resulted in no detections of Pacific pocket mice (P. Kelly, pers. comm., 1994). Although patches of suitable habitat apparently remain on the Palos Verdes Peninsula and trapping surveys of at least two sites are recommended, walk-over surveys of two other areas with suitable habitat by P. Brylski and S. Dodd revealed no pocket mouse burrows or diggings (P. Brylski, *in litt*, 1993).

It remains true that there have been no records of the Pacific pocket mouse in Los Angeles County since 1938 (Erickson 1993; see also Brylski, *in litt*, 1993). Given the available information at that time, Williams (1986) concluded that it was probable that all populations north of the San Joaquin Hills in Orange County were extirpated.

Orange County. The Pacific pocket mouse has been confirmed at two locales in Orange County: the San Joaquin Hills and Dana Point. Development of the "Spyglass Hill" area in the San Joaquin Hills began in 1972 and has resulted in the destruction of the site where the Pacific pocket mouse and a number of other small rodent species were studied for a three-year period (P. Meserve, pers. comm., 1994; R. M'Closkey, pers. comm., 1994; R. MacMillan, pers. comm., 1994; see also M'Closkey 1972 and Meserve 1972). Prior to the rediscovery of the Pacific pocket mouse in 1993 on the Dana Point Headlands (Brylski 1993), the last record of the species was from "Spyglass Hill" in the San Joaquin Hills in 1971 (see Erickson 1993). Recent June to October trapping efforts totaling 1197 trap nights in the San Joaquin Hills and adjacent Laguna Canyon were unsuccessful in detecting the Pacific pocket mouse (Erickson, pers. comm., 1993).

Elsewhere, extensive, recent small mammal surveys of the coast of Orange County away from the Dana Point Headlands have not resulted in the detection of the Pacific pocket mouse. For instance, no Pacific pocket mice were detected during 54 trapping bouts conducted from 1979 to 1994 during calendar months from March to October at a total of 24 different locales in coastal Orange County, including areas in or near Corona del Mar, Crystal Cove State Park, Laguna Beach, and San Clemente (J. Webb, *in litt,* 1994). Additional trapping efforts during late fall or winter months at some of these same locales resulted in the capture of a variety of other native small rodent species but no Pacific pocket mice.

A focused trapping survey of appropriate habitats involving a total effort of 558 trap nights during April of 1990 did not result in the detection of the Pacific pocket mouse along Aliso Creek (Jones and Stokes 1990). R. MacMillan (pers. comm., 1994) also did not detect the Pacific pocket mouse during a June, 60-trap night, survey of suitable habitat in South Laguna Beach and mentioned that an additional survey in Alta Laguna conducted for the City of Laguna Beach was unsuccessful. Surveys contributing to a total effort of 1067 trap nights conducted elsewhere within the potential Orange County range of the Pacific pocket mouse during calendar months from April through November resulted in no detections of the species (Erickson, pers. comm., 1993).

The only known population of the Pacific pocket mouse has persisted on the Dana Point Headlands in southern, coastal Orange County. Given the data and analysis presented by Brylski (1993), it is apparent that 25 to 36 Pacific pocket mice occupied approximately 3.75 acres of habitat within a coastal sage scrub community at that locale in 1993. As is discussed above, this population is located on land that is under consideration for development (City of Dana Point, *in litt,* 1994; EDAW 1994).

San Diego County. The Pacific pocket mouse historically has been detected at three general locales in San Diego County: the San Onofre area, Santa Margarita River Estuary, and the lower Tijuana River Valley. Although portions of the San Onofre area are relatively undisturbed and deserving of further attention (e.g., P. Brylski, *in litt,* 1994), recent small mammal trapping efforts at the locale failed to detect the presence of the Pacific pocket mouse (Erickson 1993; R. Erickson, pers. comm., 1993).

As is reflected in the Service's response to "Issue 3" in the "Summary of Comments and Recommendations" section of this rule, recent, intense survey efforts at the Santa Margarita River Mouth similarly have not resulted in any Pacific pocket mouse detections (Salata 1981; U.S. Fish and Wildlife Service 1994a; see also Zembal 1984). Although the relatively undisturbed coastline of Marine Corps Base Camp Pendleton "* * * probably provides the best chance for the survival of the subspecies" (Erickson 1993), the Base Environmental and Natural Resources Management Office has indicated that "[o]ther than the recorded documentation of this species in the vicinity of San Onofre and the Santa Margarita Estuary in the 1930's * * * we have no information regarding the occurrence of this species aboard Marine Corps Base Camp Pendleton. To date, none of the environmental studies which have occurred aboard the Base since that time have identified this species." (L. Armas, *in litt,* 1994).

During the 1930's, Camp Pendleton Marine Corps Base did not exist and the city of Oceanside was immediately adjacent to the Santa Margarita River Estuary. Much of the southern half of the Santa Margarita River Estuary was destroyed in the early 1940's during the establishment of Marine Corps Base Camp Pendleton and the related construction of a boat basin and harbor facilities. In addition, the Oceanside area has been extensively developed since the Pacific pocket mouse was last recorded there in 1931 and the Service is aware of little, if any, remaining suitable habitat in that jurisdiction.

The lower Tijuana River Valley, which accounts for approximately 35 percent of all specimen records (Erickson 1993), evidently supported a relatively large population of the Pacific pocket mouse in historic times (e.g., von Bloeker 1931b). Citing two recent, unsuccessful trapping efforts (Taylor and Tiszler 1991; R.T. Miller, pers. comm., 1993), Erickson (1993) commented that the remaining habitat there is possibly insufficient to support the species. Most recently, the U.S. Fish and Wildlife Service (1994b) conducted a focused survey for the Pacific pocket mouse in the Tijuana River Valley from April 18, 1994 to May 13, 1994. Despite walk-over surveys of the area, four or five trapping bouts in each of eight separate locales, and a total of 4,242 trap nights of survey effort, no Pacific pocket mice were detected.

Elsewhere in San Diego County, a small mammal trapping program that began in 1987 is continuing at Torrey Pines State Park in habitats that have ranged from maritime chaparral to open (barren) areas as a result of two prescribed burns in the project area. Since 1988, 88 traps have been set every other week from mid-March to October during the study period. Despite an effort that now exceeds 7,500 trap nights, no Pacific pocket mice have been detected (R. Dingman, pers. comm., 1994).

Analysis of the relevant data reveals that the habitat and potential range of the Pacific pocket mouse apparently have been significantly reduced in the recent past. Opportunities to find additional populations of the Pacific pocket mouse apparently are limited as a result of the extent of land development in coastal southern California (Service files).

Based on the best available scientific information, the Service considers the historic, known range of the Pacific pocket mouse to encompass a 3.2-km (2-mile) wide band along the immediate coast of Los Angeles, Orange, and San Diego Counties from Marina Del Rey/El Segundo south to the international border. Most native habitats within 3 km (2 miles) of the coast in Los Angeles, Orange and San Diego counties have been converted to urban and agricultural uses (Service files).

Specifically, less than 400 hectares (1,000 acres) or 1 percent of approximately 28,000 hectares (69,000 acres) that encompass the projected range of the Pacific pocket mouse in Los Angeles County are undeveloped (Service files). In Orange County, about 17,600 hectares (43,500 acres) or 81 percent of approximately 21,600 hectares (53,500 acres) encompassing the projected range of the species have been developed (Service files).

Oberbauer and Vanderwier (1991) reported that 72 percent of the original coastal sage scrub, 94 percent of native grasslands, 88 percent of coastal mixed chaparral, 88 percent of coastal salt marsh, 100 percent of coastal strand, and 92 percent of maritime sage scrub habitats in San Diego County had been converted to urban and agricultural uses by 1988.

Although the historic distribution of the coastal sage scrub element of Pacific pocket mouse habitat was undoubtedly patchy to some degree, this condition evidently has been greatly exacerbated by urban and agricultural development. All of the published literature on the status of coastal sage scrub vegetation in California supports the conclusion that this plant community is one of the most depleted habitat types in the United States (Service files). In a broader context, the California floristic province, which is recognized as a separate evolutionary center by botanists, is identified by Wilson (1992) as one of the recognized world "hot spots," which are defined to be "* * * habitats with many species found nowhere else and in greatest danger of extinction from human activity." The California floristic province is the only designated "hot spot" in North America and Mexico (Wilson 1992).

The available information further suggests that the quantity of potential Pacific pocket mouse river alluvium substrates have significantly declined since the species was last recorded in numbers in the 1930's. With few exceptions (such as the Santa Margarita River), essentially all of the rivers and creeks within its historic range are now partially or completely channelized. In many cases (e.g., Los Angeles River, San Gabriel River, Santa Ana River) stream and sediment flows are regulated or inhibited by dams, reservoirs or other water conservation or impoundment facilities (see also Erickson 1993).

Although some suitable Pacific pocket mouse habitat apparently remains in San Onofre and contiguous coast of Marine Corps Base Camp Pendleton, the San Joaquin Hills, the Palos Verdes Peninsula, the El Segundo Dunes and at scattered locales elsewhere in the historic range of the species, this habitat is becoming increasingly scarce and likely will continue to be destroyed, disturbed or otherwise impacted as a manifest result of human activities. Williams (1986) concluded that habitat losses resulting from off-road vehicle activities, highways, and urbanization likely were extensive. Erickson (1993) observed that industrial and agricultural development likely were additional factors contributing to the decline of the species. More recently, the Service (1994b) reported that habitats or lands in a historically-occupied Pacific pocket mouse locale apparently have been impacted by artificial lighting, disking or blading, the presence of non-native rodent species (see also Soule et al. 1992), and pedestrian and horse traffic. The Pacific pocket mouse, as a representative heteromyid rodent, may be more susceptible to the adverse effects of the human presence than cricetid rodents (R. MacMillan, pers. comm., 1994).

Although it is possible that fire may intermittently create or sustain Pacific pocket mouse habitat mosaics, it has been reported that increased fire frequency may contribute to the type conversion of coastal sage scrub to grassland habitats (Service files). In addition, the Service acknowledges that the protection of lives and property may require fire prevention strategies that do not necessarily result in the maintenance or creation of potential Pacific pocket mouse habitat. Accordingly, the Service concludes that fire prevention measures and unnaturally high fire frequencies resulting from anthropogenic ignitions may directly or indirectly impact the Pacific pocket mouse.

Equally, if not more, problematical than habitat disturbance or destruction, however, has been an increasing degree of habitat fragmentation in coastal southern California (e.g., Soule et al. 1992; Service files), which is known generally to reduce habitat quality and promote increased levels of local extinction (e.g., Terborgh and Winter 1980; Wilcox 1980; Ehrlich and Ehrlich 1981; Wilson 1992; Bolger et al. 1994 *in press*). Given the location of the research areas and thrust and direction of the investigations, the research and findings of Soule et al. (1992) are particularly relevant to a discussion of fragmentation effects on the Pacific pocket mouse.

Based on studies of native bird, rodent and flowering plant species persistence in chaparral and coastal sage scrub habitat remnants in coastal San Diego County, California, Soule et al. (1992) concluded that "[t]he effects of fragmentation in a scrub habitat in California on three taxa (plants, birds, and rodents) are concordant. Extinctions within the habitat remnants occur quickly and the sequence of species disappearances of birds and rodents is predictable based on population density in undisturbed habitat." Terborgh and Winter (1980) observed previously that "[r]arity proves to be the best index of vulnerability."

Bolger et al. (1994, *in press*) concluded that "[f]ragments support fewer species [of native rodents] than equivalently sized plots in large plots of unfragmented chaparral indicating that local extinctions have occurred following insularization." Given a composite of the available data on the local status and distribution of select species within the study area in coastal San Diego County, Soule et al. (1992) remarked that it was possible to assess with reasonable accuracy the date that a particular habitat remnant became isolated.

Soule et al. (1992) further noted that "* * * urban barriers including highways, streets, and structures, impose a very high degree of isolation." Similarly, Ehrlich and Ehrlich (1981) observed that "smaller animals may also suffer fragmentation of their populations by highways, railways, canals, etc., changing population structures and making the remaining populations smaller and more subject to random extinction. One study has indicated that a four-lane divided highway may be a barrier to the movement of small forest mammals equivalent to a river twice as wide." (Ehrlich and Ehrlich 1981). Although not a forest animal, the Pacific pocket mouse must be now considered rare by any standard and, therefore, particularly vulnerable to the effects of continuing habitat destruction and fragmentation (see Terborgh and Winter 1980).

Largely on the bases of significant habitat loss and fragmentation in coastal California, the Service has listed several other species of plants and animals as endangered or threatened, including the California least tern (*Sterna antillarum browni*), light-footed clapper rail (*Rallus longirostris levipes*), the Palos Verdes blue butterfly (*Glaucopsyche lygdamus palosverdesensis*), El Segundo blue butterfly (*Euphilotes battoides allyni*), and, most recently, the coastal California gnatcatcher (58 FR 16742; Service files). The Service listed the coastal California gnatcatcher, because of, in part, the significant and ongoing destruction, perturbation, or fragmentation of that species' coastal sage scrub habitat (58 FR 16742).

B. *Overutilization for commercial, recreational, scientific, or educational purposes.* Although the existing information and data are not conclusive, P. Brylski (pers. comm., 1994) has commented that scientific collecting in the 1930's may have substantially impacted the Pacific pocket mouse population in the El Segundo area. Erickson (1993) reported the existence of 78 specimens collected in "Hyperion" (now Marina del Rey/El

Segundo) during the fall of 1931 and spring of 1932. Otherwise, there is no substantive information that this factor is applicable.

C. *Disease or predation.* The expressed, perhaps synergistic effects of habitat fragmentation and the proximity of urban environments to Pacific pocket mouse habitats are likely to increase the rate of depredation on that species. Most recently, Soule et al. (1992) has confirmed earlier conclusions by noting that "[t]here is evidence that large predators retard the biotic collapse of these [habitat] remnants by controlling populations of smaller, semi-commensal predators, including domestic cats * * *."

Several species have been reported as potential or documented predators of the Pacific pocket mouse, including the red fox (*Vulpes vulpes*). The explosive proliferation of non-native populations of red foxes in coastal southern California is well documented (e.g., Lewis et al., 1993). Given the relative abundance of the red fox in coastal southern California (Lewis et al. 1993) and the fact that descriptions of the diet of red foxes invariably include mice (Ingles 1965; Jameson and Peeters 1988; Burkett and Lewis 1992; Lewis et al. 1993), it seems reasonable to assume that "feral" foxes similarly could substantially impact populations of Pacific pocket mice if and when the species overlap. Erickson (1993) has commented that the red fox "* * * may have hastened the demise of *pacificus*" in the El Segundo area, a locale that previously and historically accommodated the Pacific pocket mouse in numbers.

In addition, feral and domestic cats (*Felis catus*) are known to be formidable predators of native rodents (e.g., Hubbs 1951; George 1974; Frank 1992). Pearson (1964) concluded that the removal of 4,200 mice from a 14-hectare (35-acre) test plot was accomplished largely by 6 cats over 8 months.

Feral or domestic cats are threatening the only known, confirmed population of Pacific pocket mouse. Specifically, a resident living immediately adjacent to the Dana Point Headlands population reported that domestic cats had recently and repeatedly brought in a number of "tiny gray mice." One such specimen was retrieved and confirmed to be a Pacific pocket mouse (P. Brylski, *in litt*, 1993).

D. *The inadequacy of existing regulatory mechanisms.* Should protection afforded the Pacific pocket mouse pursuant to the emergency rule under the Act (59 FR 5306) lapse or otherwise be removed, other select existing regulatory or conservation mechanisms could possibly provide some protection for the species. These include—(1) the Act if the species were to occur sympatrically with a listed species, (2) the California Natural Community Conservation Planning effort, (3) the California Environmental Quality Act, (4) land acquisition and management by Federal, State, or local agencies or by private groups and organizations, and (5) local laws and regulations.

The Pacific pocket mouse is currently recognized as a Species of Special Concern "Of Highest Priority" by the California Department of Fish and Game. If emergency protection afforded the Pacific pocket mouse pursuant to the Act were to be removed prior to the promulgation of a final rule listing the species as endangered, the species would retain its status as a proposed species under the Act.

The only known, confirmed population of the Pacific pocket mouse does occur sympatrically with a population of the threatened coastal California gnatcatcher (Brylski 1993; EDAW 1993). Under provisions of section 10(a) of the Act, the Service may permit the incidental take of the coastal California gnatcatcher during the course of an otherwise legal activity, provided that the species' survival and recovery in the wild is not precluded. The issuance of section 10(a) permit to take the coastal California gnatcatcher on the Dana Point Headlands could result in the extinction of the Pacific pocket mouse.

In 1991, the State of California commenced the Natural Communities Conservation Planning (NCCP) program to address the conservation needs of natural ecosystems throughout the State. The initial focus of that program is the coastal sage scrub community, which is occupied, in part, by the Pacific pocket mouse. At the present time, however, no program plans have been completed or implemented, and no protection is currently in place or proposed to reduce or eliminate possible, future impacts to habitat occupied in 1994 by the Pacific pocket mouse on the Dana Point Headlands, which is the only known, confirmed refugium for the species.

In many instances, land-use planning decisions in southern California have been made and continue to be made on the basis of environmental review documents prepared in accordance with California Environmental Quality Act and the National Environmental Policy Act. Although impacts to sensitive species and habitats must be disclosed pursuant to these statutes, the protection or conservation of the species or their habitats are at the discretion of the decision makers. Given a composite of the best available scientific information, it is clear that these statutes have not adequately protected the Pacific pocket mouse or its habitat.

Prior to the emergency-listing of the Pacific pocket mouse as endangered, a relocation program and predator management program were proposed to mitigate impacts to the Pacific pocket mouse on the Dana Point Headlands (EDAW 1993). More recently, the City of Dana Point (City) (*in litt*, 1994) has indicated that the project applicant must, if the Pacific pocket mouse is listed, obtain a take permit for the Pacific pocket mouse prior to the issuance of any city permits "* * * that would allow activity that would harm or harass the Pacific pocket mouse * * *"

Because the Service has not received a formal, detailed mitigation proposal from the City or project proponent, the Service cannot presently assess the merits of said proposal or render a judgment as to whether or not the proposed impact avoidance and mitigation measures will prevent jeopardy to the Pacific pocket mouse. Although the Service notes and appreciates the fact that it would be given the opportunity to review the relocation program if the Pocket mouse is not listed (City of Dana Point, *in litt*, 1994), the Service has concluded that the potential effects of translocation are not relevant to a decision on whether to list a species. Under section 4 of the Act, if data warrant listing, the Service must proceed to list the species. The Service (59 FR 5308) and the California Department of Fish and Game (*in litt*, 1993) both have independently concluded that the relocation program previously outlined (EDAW 1993) is inadequate.

E. *Other natural or man-made factors affecting its continued existence.* Considering the extremely small population size and current range of the Pacific pocket mouse (no more than 36 individuals have been detected in the last 22 years), the current extent of the coastal strand, coastal dune, river alluvium, and coastal sage scrub habitats upon which it depends, further losses of habitat will have significant adverse effects on any extant populations of this species. Given all relevant data and considerations, it is apparent that the species is highly susceptible to extinction as a result of environmental or demographic factors alone (e.g., Mace and Lande 1991).

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species in determining to make this rule

final. Based on this evaluation, the Service finds that the Pacific pocket mouse warrants protection under the Act on the basis of continuing threats to the species, which include substantial habitat loss and fragmentation and depredation. Therefore, the preferred and only possible action is to list the Pacific pocket mouse as endangered, which is defined in section 3(6) of the Act as a species "which is in danger of extinction throughout all or a significant portion of its range * * *."

As provided by 5 U.S.C. 553(d), the Service has determined that good cause exists to make the effective date of this rule immediate. Delay in implementation of the effective date would place the remaining Pacific pocket mice and habitat of the species at risk (see relevant discussion below under the heading of "Critical Habitat").

Critical habitat is not being designated at this time for the reasons discussed below.

Critical Habitat

Critical habitat is defined in section 3 of the Act as: (i) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection and; (ii) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. "Conservation" means the use of all methods and procedures needed to bring the species to the point at which listing under the Act is no longer necessary.

Section 4(a)(3) of the Act, as amended, requires critical habitat to be designated to the maximum extent prudent and determinable at the time a species is listed as endangered or threatened. The Service has concluded that designation of critical habitat is not prudent for the Pacific pocket mouse at this time. The Service's regulations (50 CFR 424.12(a)(1)) state that designation of critical habitat is not prudent when one or both of the following situations exist—(1) the species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of such threat to the species, or (2) such designation of critical habitat would not be beneficial to the species.

In the case of the Pacific pocket mouse, both criteria are met. A communication has been received by the Service that effectively threatens the only known, confirmed population of the species. This threat was received from an individual who was apparently incensed at the emergency and proposed listings of the species. On the basis of this kind of activity, the Service finds that publication of critical habitat descriptions and maps would likely make the species more vulnerable to activities prohibited under section 9 of the Act.

Secondly, the only known, confirmed population of the Pacific pocket mouse is found on private property where Federal involvement in land-use activities is not expected to occur. Protection resulting from critical habitat designation is largely achieved through the Federal consultation process pursuant to section 7 of the Act and the implementing regulations pertaining thereto (50 CFR 402). Because section 7 would not apply to many, if any, of the majority of land-use activities occurring within the species' known habitat, its designation would not appreciably benefit the species.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain activities. Recognition through listing encourages and results in conservation actions by Federal, State, and local agencies, private organizations, and individuals. The Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. The protection required of Federal agencies and the prohibitions against taking and harm are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act requires Federal agencies to confer informally with the Service on any action that is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat. If a species is subsequently listed, section 7(a)(2) requires Federal agencies to insure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service. Federal agencies that may be involved through activities they authorize, fund, or carry out that may affect the Pacific pocket mouse or its historical habitat include the Army Corps of Engineers, Federal Highway Administration, the Department of the Navy (including Marine Corps Base Camp Pendleton).

The Act and implementing regulations set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. The prohibitions, codified at 50 CFR 17, in part, make it illegal for any person subject to the jurisdiction of the United States to take (including harass, harm, pursue, hunt, shoot, wound, kill, trap, or collect; or attempt any such conduct), import or export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. The term "harm" as it applies to the take prohibition is defined in 50 CFR 17.3 to include an act that actually kills or injures listed wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures listed wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. It also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife species under certain circumstances. Regulations governing permits are codified at 50 CFR 17.22, and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities.

Requests for copies of the regulations on listed wildlife and inquiries about prohibitions and permits may be addressed to the U.S. Fish and Wildlife Service, Permits Branch, 911 N.E. 11th Avenue, Portland, Oregon 97232–4181 (telephone 503/231–6241, facsimile 503/231–6243).

National Environmental Policy Act

The Fish and Wildlife Service has determined that Environmental Assessments and Environmental Impact Statements, as defined under the authority of the National Environmental

Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section (4)(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

A complete list of all references cited herein is available upon request from the U.S. Fish and Wildlife Service, Carlsbad Field Office (see **ADDRESSES** section).

Author

The primary author of this final rule is Loren R. Hays, U.S. Fish and Wildlife Service, Carlsbad Field Office (see **ADDRESSES** section).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, and Transportation.

Regulation Promulgation

Accordingly, part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, is amended as set forth below:

PART 17—[AMENDED]

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500; unless otherwise noted.

2. Section 17.11(h) is amended by revising and making permanent the entry for the "Mouse, Pacific pocket" under MAMMALS to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
Mammals							
*	*	*	*	*	*	*	*
Mouse, Pacific pocket.	*Perognathus longimembris pacificus.*	U.S.A. (CA)	Entire	E	526, 554	NA	NA
*	*	*	*	*	*	*	*

Dated: September 23, 1994.

Mollie H. Beattie,

Director, U.S. Fish and Wildlife Service.

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